

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference A160ELL	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416):
International Application No. PCT/NZ2003/000137	International Filing Date (day/month/year) 2 July 2003	Priority Date (day/month/year) 3 July 2002
International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ F02M 19/08; F04F 5/46		
Applicant ELLMERS, Peter Holmes		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheet(s).

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 30 January 2004	Date of completion of the report 29 April 2004
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer ASANKA PERERA Telephone No. (02) 6283 2373

I. Basis of the report**1. With regard to the elements of the international application:***

- ☐ the international application as originally filed.
- ☒ the description, pages **1-15**, as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☒ the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages **16-17**, received on **15 April 2004** with the letter of **15 April 2004**
- ☒ the drawings, pages **1/4-4/4**, as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 1-11	YES
	Claims	NO
Inventive step (IS)	Claims 1-11	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-11	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

The closest prior art was found in the following documents (also cited in the International Search Report):

D1 : AU 66556/81A

D2 : US 3454264A

D3 : US 3208738A

However, none of these documents teach or fairly suggest a fluid mixing venturi characterised by the defined location of the inlet rim of the booster tube as set forth in claims 1 and 11.

Therefore the subject matter of these claims is new and meets the requirements of Article 33(2) PCT with regard to novelty.

The claimed invention is not obvious in the light of any of the cited documents nor is it disclosed in any obvious combination of them. It is also considered that it would not be obvious to a person skilled in the art in the light of common general knowledge either by itself or in combination with any of these documents.

Therefore the subject matter of these claims is not obvious and meets the requirements of Article 33(3) PCT with regard to inventive step.

CLAIMS:

1. A fluid mixing venturi comprising;
a venturi barrel,
a constriction region inside said venturi barrel,
5 a fluid outlet nozzle located by nozzle location means at a central region in said venturi barrel for discharging a fluid into a fluid flowing through said venturi barrel, and
a booster tube having an inlet rim and an outlet rim and located by booster tube location means with said inlet rim positioned in the vicinity of or downstream of an outlet of said fluid nozzle, so as to surround a fluid flowing from said nozzle.
- 10 2. A fluid mixing venturi according to claim 1, wherein said venturi barrel is of cylindrical shape, and said fluid outlet nozzle is provided substantially at the center thereof, and said booster tube is of an annular shape and is positioned coaxial with said venturi barrel in the vicinity of said nozzle so as to surround fluid flowing therefrom.
3. A fluid mixing venturi according to claim 2, wherein said venturi barrel is formed
15 with flow deflection means comprising a recessed step in a wall of said venturi barrel downstream of said constriction.
4. A fluid mixing venturi according to claim 3, wherein said outlet rim of said booster tube is formed with outlet flow deflection means formed by flaring said outlet rim outwards.
- 20 5. A fluid mixing venturi according to claim 4, wherein a flare angle of said outlet flow deflection means is formed with a similar angle to said recessed step.
6. A fluid mixing venturi according to any one of claim 3 through claim 5, wherein said booster tube is positioned in said venturi barrel with said outlet rim in the vicinity of a plane containing said recessed step.

7. A fluid mixing venturi according to either one of claim 1 and claim 2, wherein said outlet rim of said booster tube is formed with outlet flow deflection means formed by flaring said outlet rim outwards.
8. A fluid mixing venturi according to any one of claim 1 through claim 7, wherein a ratio of a radius of said booster tube to a radius of said venturi bore is within a range from 0.50 to 0.65.
9. A fluid mixing venturi according to any one of claim 1 through claim 8, wherein one or more of an upper and lower section for said venturi barrel, a fluid supply assembly including said nozzle, and a booster tube assembly including said booster tube location means are molded from plastics.
10. A method of manufacturing a fluid mixing venturi according to claim 9, involving:
fitting said fluid supply assembly to said upper section,
fitting said booster tube assembly to said upper or lower section,
fitting said upper and lower sections together and
welding said upper and lower sections to make up a complete assembly.
11. A method of increasing signal and improving fluid mixing/atomization of a fluid mixing venturi comprising; a venturi barrel, a constriction region inside said venturi barrel, and a fluid outlet nozzle located by nozzle location means at a central region in said venturi barrel for discharging a fluid into a fluid flowing through said venturi barrel, said method involving: locating a booster tube with an inlet rim thereof positioned in the vicinity of or downstream of an outlet of said fluid outlet nozzle so as to surround a fluid flowing from said nozzle.